REMARKS

These remarks are in response to the Office Action dated March 22, 2007. Applicants have amended claims 16 and 56. Support for the amendments can be found throughout the specification and claims as originally filed. No new matter is believed to have been introduced. Claims 16, 54, 55 and 56 are pending and at issue. Applicants request reconsideration of the pending claims.

I. Informal Matters

Applicants wish to thank Examiners Borgeest and Kemmerer for the helpful discussions on July 2nd, 2007, with Applicant's representative.

II. Rejections Under 35 U.S.C. § 112, first paragraph

Enablement

Claims 16 and 54-57 stand rejected under 35 U.S.C. § 112, first paragraph, as the claims allegedly fail to comply with the enablement requirement. Applicants traverse this rejection as it may relate to amended claim 16.

Claim 16 has been amended to delete any reference to LHR^{exo1}. In addition, Claim 16 has been amended to recite a method of "preventing conception in a female subject by modulating chorionic gonadotropin (CG) activity." Support for this passage can be found, for example, in claim 16 as originally filed. Applicants note that the claimed method utilizes peptides that include amino acid residues constituting the LHR^{exo2} and LHR^{exo3} domains. The sequences of these domains were known in the art at the time the present application was filed (see e.g., the figure legend associated with Figure 11 as set forth in Exhibit A attached to the Response filed November 6, 2006). Accordingly, the sequence for the human LHR^{exo2} sequence has been established as Ser-Asn-Tyr-Met-Lys-Val-Ser-Ile-Cys-Phe-Pro-Met-Asp-Val-Glu-Thr-Thr-Leu-Ser-Gln. The sequence for the human LHR^{exo3} has been established as Lys-Val-Pro-Leu-Ile-Thr-Val-Thr-Asn-Ser-Lys.

As set forth in Appendix A (*Biochim. Biophys. Acta,* 1397:1-8 (1998)), which accompanies the present response, the sequence of the human LHR^{exo2} shares significant sequence homology with those identified from other species. For example, at page 5, Figure 2, of Appendix A, the sequence designated "hLHR"

shares significant homology with the LHR^{exo2} domains for chicken, rat and porcine. As can be seen in the sequence comparison provided in Figure 2 of Appendix A, the human LHR^{exo2} sequence (amino acids 506 to 525) differs from the chicken sequence (amino acids 531-550) by four (4) amino acids. Further, the human LHR^{exo2} sequence differs from the rat sequence (amino acids 510-529) by two (2) amino acids. Thus, over the 20 amino acid sequence of the LHR^{exo2} domain, the rat and chicken sequences are 80% and 90% identical to the human sequence, respectively. Claim 16 has been amended to recite, in part, a peptide comprising a sequence "at least 85% identical to the amino acid sequence of the human LHR^{exo2} domain." In view of the fact that such sequences were known prior to the filing of the present application, Applicants submit that one skilled in the art could make and use the claimed sequence(s) from the disclosures in the patent coupled with information known in the art without undue experimentation.

With regard to the LHR^{exo3}, claim 16 has been amended to recite, in part, a peptide comprising a sequence "at least 91% identical to the amino acid sequence of the LHR^{exo3} domain." Support for "91%" sequence identity can be found at Figure 10 of the application as filed. The "LHR" sequences provided in Figure 10 are derived from human, rat, mouse, bovine, pig, sheep and carja. Applicants note that the carja sequence differs from the other sequences by one (1) amino acid. Further, Figure 21 describes the effects of alanine substitutions on the human LHR^{exo3}. The majority of the substitutions do not impact, or minimally impact, the ability of the LHR^{exo3} sequence to bind to chorionic gonadotropin. In view of this information, Applicants submit that one skilled in the art could make and use the claimed sequence(s) without undue experimentation.

Claim 16 has also been amended to recite peptides comprising human LHR^{exo2} or human LHR^{exo3} having a length of "19-21" or "10-12" residues, respectively. As previously noted, the human LHR^{exo2} domain is 20 amino acid residues in length, and the human LHR^{exo3} domain is 11 amino acids in length. Given the information provided in the specification for identifying peptides that bind to GC (see e.g., paragraphs [0283] - [0304] of US Patent Application Publication No. 2005/0142135) the amount of experimentation required to make peptides that include an additional one (1) or two (2) residues would not be undue. Applicants submit that the novelty of the claimed method lies not in the use of novel peptide

sequences, but instead relies on the novel observation that exoloop domains of the LHR interact with GC. Accordingly, the moderate sequence variations encompassed by the peptides utilized in the claimed method are well within the ability of the skilled artisan to manufacture because they are inherently limited to those that bind to CG and inhibits CG interaction with the exoloop 2 or exoloop 3 domain of the LHR.

Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. §112, first paragraph be withdrawn.

Written Description

Claims 16 and 54-56 stand rejected under 35 U.S.C. § 112, first paragraph, as the claims allegedly fail to comply with the written description requirement. Applicants traverse this rejection as it may apply to amended claim 16.

To advance prosecution Applicants have amended claim 1 to be limited to those peptides that include a subset of peptides encompassing the LHR^{exo2} or LHR^{exo3} domains, and limited variants thereof. As previously noted, the novelty of the claimed method lies not in the use of novel peptide sequences, but instead relies on the novel observation that exoloop domains of the LHR interact with GC. Accordingly, a description of the complete structure of every sequence variation encompassed by the peptides utilized in amended claim 16 is not required in order to satisfy the written description requirement of §112, first paragraph. All that is required is that the applicant convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed. Applicants submit that these requirements are met in view of the amendments to claim 16 and in light of the information provided in the specification.

In general, in order to satisfy the written description requirement of §112 the applicant must convey to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. According to the holding in Falkner v. Inglis (Fed. Cir. 2006, 05–1324), and consistent with previous Federal Circuit case law, there is no per se rule that an adequate written description of an invention that involves a biological macromolecule must contain a recitation of a known structure. Consistent with the holding in Falkner, the instant specification need not explicitly recite every possible sequence of a peptide provided that the skilled artisan already

has possession of such information. As noted above in Applicants "Enablement" discussion, the skilled artisan clearly had possession of knowledge specifically related to the sequences of the human LHR^{exo2} domain and the human LHR^{exo3} domain. Further, the skilled artisan possessed knowledge sequences derived from other species that were similar to the human LHR^{exo2} domain and the human LHR^{exo3} domain. Coupled with the knowledge possessed by the skilled artisan, the specification clearly contemplates and provides support for a limited genus of peptides associated with the amino acid sequence of the human LHR^{exo2} domain and the human LHR^{exo3} domain.

Applicants submit that sequence and structural information related to the LHR polypeptide was available at least as early as 1998. With regard to the LHR^{exo2} domain, an example of such information accompanies the present Reply as Appendix A (see e.g., Figure 2). Accessible literature sources clearly provided, as of the relevant date, information about the human LHR^{exo2} domain sequence and satisfaction of the written description requirement does not require more. With regard to the LHR^{exo3} domain, Figures 10 and 21 provide support for peptides that are similar to the human peptide. It is clear that the sequence and structure of the LHR polypeptide was known to the skilled artisan at the time the application was filed. Accordingly, it was unnecessary for the Applicants to reproduce this information in the present specification. As the court stated in Capon v. Eshhar:

> "[t]he 'written description' requirement states that the patentee must describe the invention; it does not state that every invention must be described in the same way. As each field evolves, the balance also evolves between what is known and what is added by each inventive contribution." 418 F.3d 1349, 1358 (Fed. Cir. 2005).

The skilled artisan will recognize that Applicants envisioned peptides possessing sequences marginally different from the known sequences of the human LHR^{exo2} domain and LHR^{exo3} domain while retaining a specific biological activity (e.g., binding to CG). Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. §112, first paragraph be withdrawn.

III. Claim Rejections Under 35 U.S.C. § 102(b)

Claims 16 and 54-56 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hsueh et al. (US patent No. 5,925,549). Applicants traverse this rejection as it may apply to amended claim 16. According to the Interview Summary mailed July 16, 2007, the rejection over Hsueh would be withdrawn. Accordingly, Applicants request withdrawal of this rejection.

IV. Conclusion

It is respectfully submitted that all rejections have been overcome by the above amendments. Thus, Notice of Allowance is respectfully requested. In the event that there are any questions relating to this Amendment or the application in general, it would be appreciated if the Examiner would contact the undersigned attorney by telephone at (858) 509-7318 so that prosecution of the application may be expedited.

Respectfully submitted,

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